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EXAMINER	
MUTSCHLER, BRIAN L	
ART UNIT	**PAPER NUMBER**
1753	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/890,864	HAUSSLER ET AL.
	Examiner	Art Unit
	Brian L. Mutschler	1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *15-45* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *15-45* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 14, 2003, has been entered.

Comments

2. The rejection of claims 31 and 42 under 35 U.S.C. § 112, first paragraph, has been withdrawn in light of Applicant's identification of support in the specification.

3. The Examiner notes an apparent discrepancy in the art when describing the material zinc oxide. This apparent discrepancy arises in the description of the electrical conductivity/resistivity of zinc oxide and the terminology used in the description of the material in relation to its use on the particular application. All materials have some conductivity as well as some resistivity; conductivity and resistivity are inversely related to one another. As explained in *The Science and Design of Engineering Materials*, for ionic solids, "charge motion and, hence, electrical conduction often require movement of entire ions ... [and s]ince such motion is comparatively difficult and slow, and the density of mobile ions is considerably less than the density of mobile electrons in metals, ionic solids are generally characterized as electrical insulators rather than

electrical conductors" (see *The Science and Design of Engineering Materials*, p. 41). As an ionic solid, the general definition of zinc oxide as an electrical insulator is consistent with the disclosure in the present application, which defines zinc oxide as a dielectric by itself (see page 2 of the present disclosure). However, zinc oxide, even though it is known in the art as a dielectric, still maintains at least some conductivity. Conductivity and resistivity lie at opposite ends of a spectrum. Data found in the *Kirk-Othmer Encyclopedia of Chemical Technology* and in the article "Properties of Piezoelectric Thin Films for Micromechanical Devices and Systems" elucidates the teachings in *The Science and Design of Engineering Materials*. Copper, which is well known to be a very good conductor, still has a resistivity of 16.7×10^{-9} Ω·m. Zinc oxide, a dielectric material, has a resistivity of 2.5×10^{6} to 1.0×10^{7} Ω·m. As taught by Chen et al. (U.S. Pat. No. 5,078,804), however, even though zinc oxide is a known as a dielectric, it is also capable of conducting electricity. In the solar cell of Chen et al., both a high resistivity and a low resistivity zinc oxide layer are formed within the device, each of the layers made only of zinc oxide, i.e., no dopants are required to lower the resistivity of the zinc oxide (see US '804 col. 4, line 62 to col. 5, line 8). This teaching is also consistent with the teachings in the references of Weber et al. (U.S. Pat. No. 4,940,495) and Berman et al. (U.S. Pat. No. 4,663,495). Weber et al. teach that the zinc oxide layer is "optionally doped" (see US 4,940,495 at col. 3, lines 66-68). Similarly, Berman et al. teach, "Electrical conductivity of ZnO for this purpose *can be enhanced* by addition of group III elements or hydrogen" (emphasis added by Examiner; see US 4,663,495 at col. 9, lines 33-35). Therefore, even though zinc oxide is capable of conducting at least

some electricity, undoped zinc oxide is considered to be a dielectric material as defined by the present disclosure and as supported by the references relied upon above.

Claim Objections

4. Claims 16, 18, 19, 23, 26, 27, 29, 34, 37, 38 and 41 are objected to because of the following informalities:

a. Claims 16, 18, 19, 23, 26, 27, 29, 34, 36-38 and 41 use inconsistent claim language. The "first refractive dielectric" layer recited in the independent claims is referred to as either the "first refractive layer" or "the first dielectric layer" in the dependent claims. It is suggested that consistent language be used to describe the features. The term "first refractive dielectric" is preferred due to the presence of other limitations reciting only refractive layers.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 16, 18, 24, 25, and 36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 16 recites the limitation "said at least one first dielectric layer" in line 2. There is insufficient antecedent basis for this limitation in the claim. It is suggested that the phrase be changed to --said one or more first refractive dielectric layer--.

Claims 18, 25, and 36 recite limitations relating to the window electrode. In each of the independent claims, the window electrode is defined as comprising at least a metallic layer and an antireflective layer. However, in claims 18, 25, and 36, the window layer is defined as containing a different succession of layers, which does not include the antireflective layer. Therefore, the structure of the window electrode is indefinite.

Claim 24 recites is indefinite because the relationship between the window electrode, metallic layer and antireflective layer is not clear. As recited in the claim, the metallic layer and antireflective layer are not part of the window electrode. It is suggested that claim language similar to claim 15 be used to describe the window layer, e.g., change "with" to --said window electrode comprising-- in line 4.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 15, 17, 20, 22, 24, 25, and 45 are rejected under 35 U.S.C. 102(b) as being anticipated by Kanai et al. (U.S. Pat. No. 5,220,181), with supporting evidence provided by Tyan (U.S. Pat. No. 4,207,119).

Regarding claims 15, 24, and 45, Kanai et al. disclose a solar cell comprising an absorber layer **103**, a transparent metallic layer **105** and an antireflective coating **106**, wherein an insulating layer **104** is placed between the absorber layer **103** and the metallic layer **105** (fig. 1(A); col. 23, lines 38-47; col. 25, lines 19-23).

Regarding claim 17, the metallic layer **105** can be made of silver and the antireflective layer **106** can be made of a refractive oxide, such as indium tin oxide (col. 25, lines 16-18; col. 29, line 25 to col. 30, line 65).

Regarding claim 20, the insulating layer **104** can be made of Si_3N_4 (col. 30, lines 53-65).

Regarding claim 22, in one example, the metallic layer **105** has a thickness of 30Å (3 nm), and the antireflective layer **106** has a thickness of 15Å (1.5 nm), for a total thickness of 45Å (4.5 nm) (col. 30, lines 53-65).

Regarding claim 25, the metallic layer **105** is formed between the refractive dielectric, insulating layer **104** and the refractive, antireflective layer **106** (fig. 1(A)).

It is noted that the metallic layer and the antireflective coating is not disclosed as a window electrode, as recited in claims 15, 24, and 45 of the instant invention. Kanai et al. disclose the use of a transparent metallic layer **105** that acts as an electrode in conducting the current out of the solar cell (fig. 1(A)). Tyan discloses the use of transparent electrodes as "window electrodes" because they are able to transmit light (col. 5, lines 38-47). Therefore, the metallic layer **105** of Kanai et al. would be a window electrode. (The collector electrode **107** disclosed by Kanai et al., which is used to

reduce the resistance of the metallic layer, is similar to the solder connection **26** used by Tyan.)

Since the use of the solar cell of Kanai et al. requires the construction of the solar cell, the limitations recited in the method claims, e.g., providing and forming the layers, is anticipated by the solar cell of Kanai et al.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 15-20, 22, 24-26, 28, 32, and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weber et al. (U.S. Pat. No. 4,940,495) in view of Chen et al. (U.S. Pat. No. 5,078,804).

Regarding claims 15, 18, 24-26, and 45, Weber et al. disclose a light transmitting electrically conductive stacked film for use in solar cells. The stacked film **18** comprises a first conductive oxide layer **22** and a second conductive oxide layer **24**, with a metallic film layer **26** interposed between the layers (col. 2, lines 56-66). An optional encapsulant layer **20** maintains a reduced reflection and increased transmission of the solar cell (col. 3, lines 53-55).

Regarding claims 16, 17, and 20, the conductive oxide layers **22** and **24** are preferably made of ZnO, SnO_2 or TiO_2, and have a high index of refraction (col. 3, line

56 to col. 4, line 1). The layer of ZnO must exhibit at least some conductivity and is only optionally doped with other materials (col. 3, lines 56-68). The metal layer **26** is preferably made of silver (col. 4, lines 16-25).

Regarding claim 19, Weber et al. disclose the benefits additional layers to create "an even more efficient top conductive contact", wherein "the multiples of stacked films which may be employed are limited primarily by absorption in the silver and oxide films" (col. 7, lines 8-10 and lines 53-55).

Regarding claim 22, in Example 2, Weber et al. disclose a window electrode having a silver layer with a thickness of 8 nm, and a total thickness of 93 nm (col. 6, lines 56-63).

The solar cell of Weber et al. differs from the instant invention because Weber et al. do not disclose the following:

a. An antireflective layer on the light-incident side of the window electrode, as recited in claims 15, 24 and 45.

b. The antireflective layer is a refractive oxide or nitride layer, as recited in claim 17.

c. The window electrode comprises a first refractive layer, a first metallic layer, a second refractive layer, a second metallic layer, and an antireflective layer formed in succession, as recited in claim 19.

d. The absorber is a chalcopyrite layer, as recited in claim 28.

e. The absorber layer has a CIS structure, as recited in claim 32.

Regarding claims 15, 17, 28, and 32, Chen et al. disclose the use of an antireflective layer **70** made of silicon nitride and silicon oxide on a solar cell containing a window electrode comprising layers of conductive and refractive zinc oxide layers **50** and metallic layers **60** (fig. 1 and 2). Chen et al. further disclose the use of a CIGS solar cell, a quaternary analog to CIS solar cells (col. 1, lines 53-56).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the device of Weber et al. to use an antireflective coating, as taught by Chen et al., because using an antireflective coating increases the amount of sunlight that reaches the semiconductor layer, which increases the photoelectric conversion efficiency.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the device of Weber et al. to use a CIS based solar cell, as taught by Chen et al., because CIS and CIGS solar cells have a higher efficiency than silicon solar cells.

Regarding claim 19, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the device of Weber et al. to use a second metallic layer between the second refractive layer and the antireflective layer because Weber et al. teach that the use of multiple metallic layers result in a more efficient top conductive contact (col. 7, lines 8-10).

The method of making the solar cell having the limitations described above is inherent because the use of the solar cell requires the limitations recited in the method claims of providing and forming different layers.

11. Claims 15-22, 24-27, 29-31, 33-40, 42, 44, and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berman et al. (U.S. Pat. No. 4,663,495) in view of Arimoto (U.S. Pat. No. 6,071,753).

Regarding claims 15, 24, 33 and 45, Berman et al. disclose a thin-film solar cell **10** comprising an absorber layer **12** and a transparent window electrode layer **14** having a metallic layer and an oxide layer formed between the absorber layer and the metallic layer (col. 3, lines 49-63; col. 9, lines 20-35).

Regarding claims 16-18, 20, 21, 25-27, 34-36, 38 and 39, both the front electrode **14** and a rear electrode **16** comprise a stack structure formed by a pair of ZnO layers on either side of a silver layer (col. 9, lines 20-35). Although the ZnO layer is conductive, Berman et al. discloses, "Electrical conductivity of ZnO for this purpose *can be enhanced* by addition of group III elements or hydrogen" (col. 9, lines 31-35; emphasis added by Examiner).

Regarding claims 19 and 37, Berman et al. disclose that a stacked structure **132** of metallic layer **134** and a metallic oxide layer **136** "may be repeated a number of times to increase conductivity" (col. 10, lines 16-17).

Regarding claims 22, 29, 30, 33, 40 and 44, the ZnO layers have a thickness ranging from 400-1000 angstroms (40-100 nm) and the silver layer has a thickness of 50-200 angstroms (5-20 nm) (col. 9, lines 20-35).

The solar cell of Berman et al. differs from the instant invention because Berman et al. do not disclose the use of an antireflective layer, as recited in claims 15, 24, 31, 33, 42 and 45.

Antireflective layers are commonly used to increase the amount of light absorbed by solar cells to increase the overall conversion efficiency. Arimoto discloses a solar cell using an antireflective layer comprised of a nitride or oxide film and having a thickness in the range of several hundred to 1000 angstroms (col. 8, line 65 to col. 9, line 3).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the solar cell of Berman et al. to use an antireflective layer as taught by Arimoto because an antireflective coating would increase the conversion efficiency of the solar cell.

The overall thickness of the window electrode would be less than 120 nm using the combination of Berman et al. and Arimoto.

Regarding claims 31 and 42, using silicon nitride as taught by Arimoto would provide a structure comprising a layer of nitride covering an oxide layer, as recited in the instant claims.

The method for making the solar cell is inherently taught by Berman et al. and Arimoto because the only way to produce a solar cell having the taught structure would be through the use of the claimed method.

12. Claims 21 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weber et al. (U.S. Pat. No. 4,940,495) in view of Chen et al. (U.S. Pat. No. 5,078,804), as applied above to claims 15-20, 22, 24-26, 28, 32, and 45, and further in view of Nath et al. (U.S. Pat. No. 5,176,758).

Weber et al. and Chen et al. describe a solar cell and method for making the solar cell having the limitations recited in claims 15-20, 22, 24-26, 28, 32, and 45 of the instant invention, as explained above in section 10.

The apparatus and method described by Weber et al. and Chen et al. differ from the instant invention because they do not disclose the formation of a second electrode comprising at leas one metallic layer and one refractive layer.

Nath et al. disclose a light-transmissive solar cell comprising transparent electrodes on both sides of the device (col. 2, lines 3-11).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the device described by Weber et al. and Chen et al. to use a second transparent electrode similar to the first transparent electrode because Nath et al. teaches the formation of transparent electrodes on both sides of a solar cell, yielding a device which can absorb light from both sides of the solar cell or transmit light through the cell.

13. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Weber et al. (U.S. Pat. No. 4,940,495) in view of Chen et al. (U.S. Pat. No. 5,078,804), as applied above to claims 15-20, 22, 24-26, 28, 32, and 45, and further in view of Yamazaki (U.S. Pat. No. Re. 33,208).

Weber et al. and Chen et al. describe a solar cell and method for making the solar cell having the limitations recited in claims 15-20, 22, 24-26, 28, 32, and 45 of the instant invention, as explained above in section 10.

The apparatus and method described by Weber et al. and Chen et al. differ from the instant invention because they do not disclose a blocking layer between the metallic layer and the refractive layer.

Yamazaki discloses the use of a blocking layer as a means for preventing impurities from entering the active regions of the solar cell (col. 4, line 18).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the device described by Weber et al. and Chen et al. to use a blocking layer, as taught by Yamazaki, because using a blocking layer would prevent impurities from reaching the active regions of the solar cell.

14. Claims 23 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berman et al. (U.S. Pat. No. 4,663,495) in view of Arimoto (U.S. Pat. No. 6,071,753), as applied above to claims 15-22, 24-27, 29-31, 33-40, 42, 44, and 45, and further in view of Yamazaki (U.S. Pat. No. Re. 33,208).

Berman et al. and Arimoto describe a solar cell having the limitations recited in claims 15-22, 24-27, 29-31, 33-40, 42, 44, and 45 of the instant invention, as explained above in section 11.

The solar cell described by Berman et al. and Arimoto differs from the instant invention because they do not disclose the device comprising a blocking layer between the metallic layer and the refractive layer.

Yamazaki discloses the use of a blocking layer as a means for preventing impurities from entering the active regions of the solar cell (col. 4, line 18).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the device described by Berman et al. and Arimoto to use a blocking layer, as taught by Yamazaki, because using a blocking layer would prevent impurities from reaching the active regions of the solar cell.

15. Claims 28, 32 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berman et al. (U.S. Pat. No. 4,663,495) in view of Arimoto (U.S. Pat. No. 6,071,753), as applied above to claims 15-22, 24-27, 29-31, 33-40, 42, 44, and 45, and further in view of Chen et al. (U.S. Pat. No. 5,078,804).

Berman et al. and Arimoto describe a solar cell having the limitations recited in claims 15-22, 24-27, 29-31, 33-40, 42, 44, and 45 of the instant invention, as explained above in section 11. Berman et al. also disclose that the solar cell "may contain any suitable photovoltaic material defining a photojunction for conversion of light to electrical energy" (col. 6, lines 50-52). Silicon is disclosed as a specific example

The solar cell described by Berman et al. and Arimoto differs from the instant invention because they do not disclose the absorber comprising a chalcopyrite, as recited in claim 28, or forming the absorber of a CIS structure, as recited in claims 32 and 43.

Chen et al. disclose the use of an antireflective layer **70** on a solar cell containing a window electrode comprising layers of conductive and refractive zinc oxide layers **50** and metallic layers **60** (fig. 1 and 2). Chen et al. further disclose the use of a CIGS solar cell, a quaternary analog to CIS solar cells (col. 1, lines 53-56).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the solar cell described by Berman et al. and Arimoto to use a CIS based solar cell, as taught by Chen et al., because CIS and CIGS solar cells have a higher efficiency than silicon solar cells and are suitable materials for forming photojunctions.

Response to Arguments

16. Applicant's arguments filed October 14, 2003, have been fully considered but they are not persuasive.

17. Regarding the rejection of the claims using the reference of Weber et al., Applicant argues that the zinc oxide layer **22** use in the solar cell of Weber et al. would have to be doped to be conductive (see page 8 of Applicant's response). As explained above under the heading "Comments", zinc oxide does not need to be doped to be conductive. Zinc oxide by itself is capable of conducting at least some electricity.

Weber et al. teach that the layer **22** must "exhibit at least some electrical conductivity" and that the ZnO layer is "optionally doped" (see col. 3, lines 56-68). Since undoped zinc oxide has been defined as a dielectric, the zinc oxide layer of Weber et al. satisfies all of the limitations recited in the claims. In addition, while Weber et al. might prefer the use of doped oxide layers, the undoped zinc oxide layer is still taught by Weber et al. (See MPEP § 2123 - "A known or obvious composition does not become patentable simply because it has been described as somewhat inferior to some other product for the same use." *In re Gurley*, 27 F.3d 551, 554, 31 USPQ2d 1130, 1132 (Fed. Cir. 1994).)

18. Regarding Applicant's argument on pages 8-9 that the claimed invention is distinguished because it may include two dielectric layers, it is noted that a single dielectric layer still anticipates the limitation. The language "one or more" does not exclude the teaching of a single layer.

19. Regarding the use of the Berman et al. reference, Applicant argues that there would be no motivation to use combine the Berman et al. reference because it teaches that the zinc oxide must be electrically conductive (see page 9 of Applicant's response). As explained above with respect to the use of the Weber et al. reference, undoped zinc oxide has been defined as a dielectric material. Like Weber et al., Berman et al. teach that the conductivity of the zinc oxide layer "can be enhanced" with dopants (see col. 9, lines 31-35). Therefore, Berman et al. teach that the zinc oxide can be enhanced by doping but it does not have to be enhanced by doping.

20. Regarding Applicant's statements pertaining to the dimensions of the layers (see page 9 of Applicant's response), Berman et al. as well as Kanai et al. teach the use of layers having dimensions within the claimed ranges.

21. Regarding Applicant's statements about new claim 45, Weber et al., Berman et al., and Kanai et al. teach the use of a single dielectric layer positioned between the absorber and the metallic layer.

Conclusion

22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian L. Mutschler whose telephone number is (571) 272-1341. The examiner can normally be reached on Monday-Friday from 7:30am to 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

NAM NGUYEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700

blm
January 7, 2004